

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IB 02/02080

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/22 C07K14/255 C07K14/30 C07K14/315 C07K14/36
 C12N15/31 A61K39/02 A61K39/095 A61K39/112

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TETTELIN H ET AL: "COMPLETE GENOME SEQUENCE OF NEISSERIA MENINGITIDIS SEROGROUP B STRAIN MC58" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 287, 2000, pages 1809-1815, XP000914963 ISSN: 0036-8075 cited in the application	17,18,26
X	-& DATABASE EMBL 'Online! gene NMB1343, 15 March 2000 (2000-03-15) "N. meningitidis serogroup B strain MC58 section 124 of 206 of the complete genome" retrieved from EBI Database accession no. AE002482 XP002239404 related to SEQ ID No. 2; 100% identity in 435 nt overlap from pos. 9519-9953 abstract -/--	17,18,26

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 April 2003

Date of mailing of the international search report

31.07.03

Name and mailing address of the ISA

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International Application No.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	cds 9519..9956; hypothetical protein	1
A	-& DATABASE SWALL 'Online! 15 October 2000 (2000-10-15) "Hypothetical protein NMB 1343" retrieved from EBI Database accession no. Q9JZ10 XP002239405 related to SEQ ID No. 1; 100% identity in 145nt overlap from pos. 1-145 abstract	1
X	ALA'ALDEEN D A A ET AL: "CLONING, SEQUENCING, CHARACTERISATION AND IMPLICATIONS FOR VACCINE DESIGN OF THE NOVEL DIHYDROLIPOYL ACETYLTRANSFERASE OF NEISSERIA MENINGITIDIS" JOURNAL OF MEDICAL MICROBIOLOGY, HARLOW, GB, vol. 45, December 1996 (1996-12), pages 419-432, XP009009026 ISSN: 0022-2615 page 424, second column, lines 1-3 of second paragraph and lines 1-8 of third paragraph	17,18,26
X	-& DATABASE EMBL 'Online! 25 November 1994 (1994-11-25) ALA'ALDEEN, D.: "N. meningitidis pdh gene cluster" retrieved from EBI Database accession no. X82637 XP002239406 related to SEQ ID No. 2; 100% identity in 435 nt overlap from pos. 4708-5142 abstract	17,18,26
X	DATABASE EMBL 'Online! 8 March 1994 (1994-03-08) GUILLEN, G.: "N. meningitidis outer membrane protein P64k (pm-6) gene" retrieved from EBI Database accession no. X77920 XP002239407 related to SEQ ID No. 2; 99.7 % identity in 435 nt overlap from pos. 170-603 abstract	17,18,26

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! 4 December 2000 (2000-12-04) FRAZER, C.M. ET AL.: "N. meningitidis partial DNA sequence gnm_35 SEQ ID No. 35" retrieved from EBI Database accession no. AAA81487 XP002239408 related to SEQ ID No. 2; 100% identity in 435 nt overlap from pos. 24115-24549 abstract & WO 00 22430 A (CHIRON CORP.) 20 April 2000 (2000-04-20)</p> <p>---</p>	17,18,26
X	<p>DATABASE EMBL 'Online! 24 November 2000 (2000-11-24) PIZZA, M. ET AL.: "Neisseria genomic sequences; Sequence 111" retrieved from EBI Database accession no. AX044032 XP002239409 related to SEQ ID No. 2; 100% identity in 435 nt overlap from pos. 163680-164114 abstract & WO 00 66791 A (CHIRON CORP.; THE INSTITUTE FOR GENOMIC RESEARCH) 9 November 2000 (2000-11-09)</p> <p>---</p>	17,18,26
X	<p>DATABASE EMBL 'Online! 25 March 1991 (1991-03-25) DAMS, E. ET AL.: "Cholera toxin A protein (CTA)" retrieved from EBI Database accession no. CAA41592 XP002239410 cited in the application abstract</p> <p>---</p>	2,4-6,9
X	<p>DATABASE EMBL 'Online! MASON, H. S. AND ARNTZEN, C.J.: "Plant-optimized mutant V.cholera toxin subunit K63" retrieved from EBI Database accession no. AAY966654 XP002239411 100% identity in 258 nt overlap with sequence of accession number CAA41592 abstract</p> <p>---</p> <p style="text-align: center;">-/--</p>	10

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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GIUDICE DEL G ET AL: "GENETICALLY DERIVED TOXOIDS FOR USE AS VACCINES AND ADJUVANTS" VACCINE, BUTTERWORTH SCIENTIFIC. GUILDFORD, GB, vol. 17, no. SUPPL 2, 1 October 1999 (1999-10-01), pages S44-S52, XP000996148 ISSN: 0264-410X the whole document ----	12-15, 22-25
A	KRUEGER, K. AND BARBIERI, J.T.: "The family of bacterial ADP-ribosylating exotoxins" CLINICAL MICROBIOLOGY REVIEWS, vol. 8, no. 1, January 1995 (1995-01), pages 34-47, XP002239403 the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 02/02080**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claim 25 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

1-26
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-26

Protein related to SEQ ID No. 1; Mutants of that protein, specifically SEQ ID Nos. 10, 12, 14 and 16; DNA encoding the protein, specifically SEQ ID No. 2, 11, 13, 15, 17; vectors and host cells comprising the above nucleic acids; antibodies; compositions related to the above protein or nucleic acid; use of the protein and method of treatment

2. Claims: 1-7, 9-26

as subject 1, but related to SEQ ID No. 3,

3. Claims: 1-7, 9-26

as subject 1, but related to SEQ ID No. 4

4. Claims: 1-7, 9-26

as subject 1, but related to SEQ ID No. 5

5. Claims: 1-7, 9-26

as for subject 1, but related to SEQ ID No. 6

6. Claims: 1-7, 9-26

as for subject 1, but related to SEQ ID No. 7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 02/02080

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0022430 A	20-04-2000	AU 1202200 A	01-05-2000
		AU 761780 B	12-06-2003
		AU 3967799 A	23-11-1999
		BR 9914374 A	17-09-2002
		CA 2330838 A	11-11-1999
		CA 2346713 A	20-04-2000
		CN 1373806 T	09-10-2002
		CN 1338005 T	27-02-2002
		EP 1093517 A	25-04-2001
		EP 1144998 A	17-10-2001
		AU 3249200 A	17-11-2000
		BR 0010361 A	10-06-2003
		CA 2371032 A	09-11-2000
		CN 1359426 T	17-07-2002
		EP 1185691 A	13-03-2002
		WO 0066791 A	09-11-2000
WO 0066791 A	09-11-2000	AU 3249200 A	17-11-2000
		AU 3947801 A	12-09-2001
		AU 3948801 A	12-09-2001
		BR 0010361 A	10-06-2003
		CA 2371032 A	09-11-2000
		CA 2400562 A	07-09-2001
		CA 2400570 A	07-09-2001
		CN 1359426 T	17-07-2002
		CN 1426471 T	25-06-2003
		CN 1426473 T	25-06-2003
		EP 1185691 A	13-03-2002
		EP 1261723 A	04-12-2002
		EP 1259627 A	27-11-2002
		WO 0164920 A	07-09-2001
		WO 0164922 A	07-09-2001
		AU 1202200 A	01-05-2000
		BR 9914374 A	17-09-2002
		CA 2346713 A	20-04-2000
		CN 1338005 T	27-02-2002
		EP 1144998 A	17-10-2001
		WO 0022430 A	20-04-2000